Submitted in consideration for the Department of Energy's Design Contest #3: Open Data by Design

Submitted by EnergyBill.com LLC

8/11/2014

Introduction

We apologize for not including a YouTube video with our submission. We got into the contest very last-minute and with several targets moving at the same time it just wasn't possible for us to get that done in time.

The data feature that we are focusing on is Green Button Data.

We are presenting screen shots of our design, as well as a live version that can be accessed through desktop or mobile web browsers.

Live Demo

Live demo can be accessed at **http://doe.energybill.com**

Note that the demo is both live and under construction. Updates will be posted to the live demo as they are completed on a daily basis. Data for this demo is live and being updated in realtime. For this demo we are monitoring a single residential home in south Texas. Because the demo is live, certain features have been disabled, like thermostat control. After reading the design description this will make more sense.

Design Description

Our design is a sneak peek of a patent-pending system that we are developing and hope to bring to the market soon. The features that we are showing you focus on Green Button smart meter data.

This is a design concept for taking advantage of Green Button energy consumption data, and making it available to consumers in a way that is useful to them and also easy for them to understand. Right now there are a lot of different data sources that are available to consumers, but the problem is that by themselves those data sets are of limited value and there is currently no way to correlate them together.

Green Button data, for instance, is nothing more than electrical power consumption data, kilowatt hours, recorded at various intervals. Most users do not understand what a kilowatt hour is, and they also don't care. It's too complicated and just not useful. But this data actually contains a

lot of really useful information. Our design solves this problem by combing green button data with several other data sources.

For this design we combine 4 primary data sources: weather, billing, smart thermostat, and Green Button. EnergyBill.com operates by automatically pulling in all these data sources together on behalf of the consumer. It is a turnkey process where the user simply creates an account on our system, and we are then able to:

- Link to their utility company and collect their billing history automatically and on a continuous ongoing basis.

- Link to their utility or other source, such as Smart Meter Texas, to retrieve Green button data automatically. This data is retrieved on a recurring daily and hourly basis.

- Link to any smart thermostat installed in the home or structure, such as Honeywell Lyric, Nest, Ecobee, etc. Data is automatically pulled from the thermostat at a regular interval.

- Weather data is pulled from a reliable weather source for the area, such as Weather.com or Weather Underground.

By correlates these data sources together energybill.com performs analysis in order to create a system model of the consumer's structure and their load patterns. We then makes this model available to consumers through a single access point, such as a desktop computer or mobile phone.

Design mockups to follow.

Desktop Design

Usage

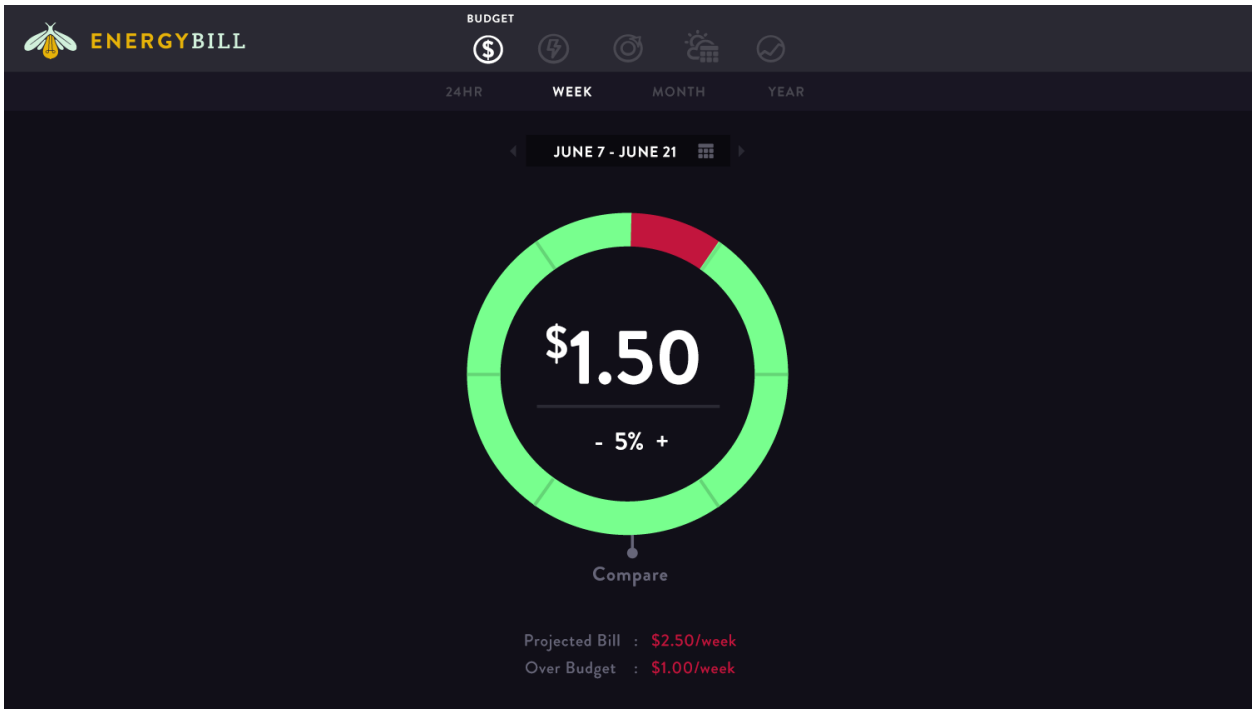
This is a proof of a user interface screen for consumer usage information. On this screen the user is able to see the trend of all their historical and current usage, with weather dependent and independent loads separated. Comparisons can then be made between window in time and another. With the current billing information consumption data is presented to the user in terms of cost.

Based on all the historical data, projections are made for future usage patterns, shown in orange in the proof. Current data being measured in real-time from each data source is then used to predict what future usage patterns will be, and what the cost of those predicted patterns are.

Budget

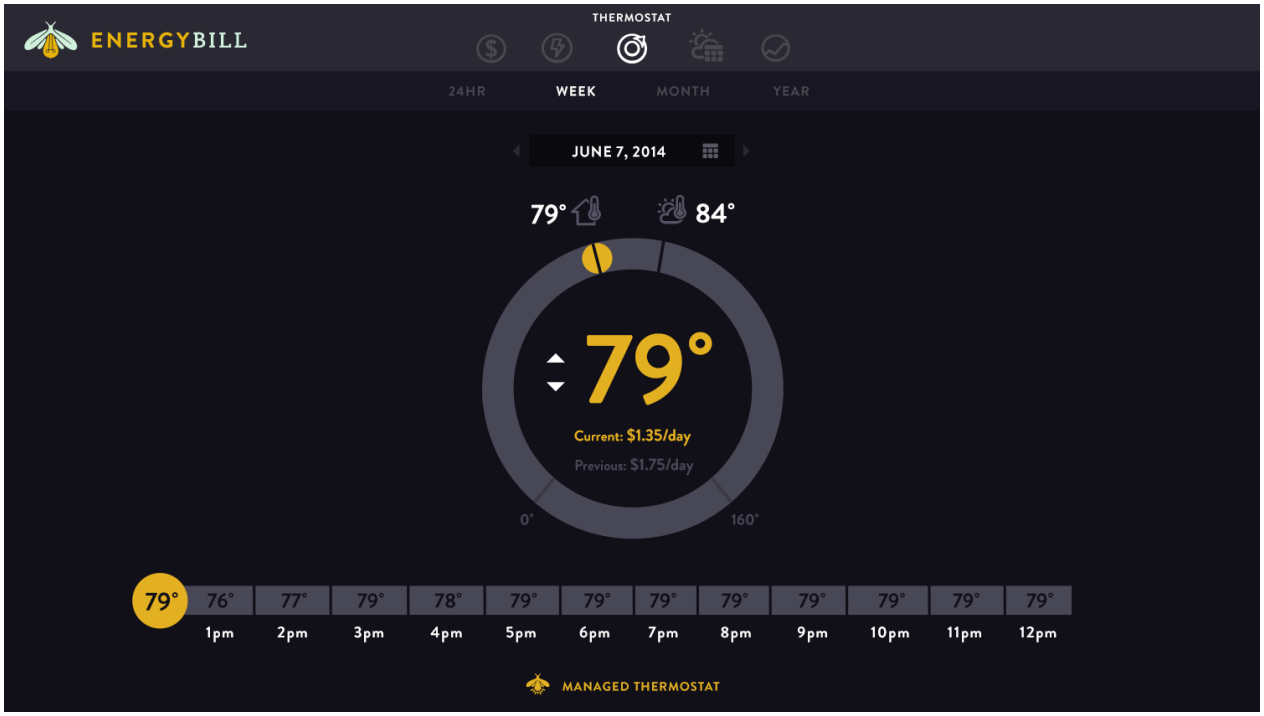
Based on historical trends, and feedback from the user, a budget is automatically created for the user, helping them to monitor their daily, weekly, and monthly consumption and make effective and practice pattern changes to work towards saving energy and money.

As the period progresses, be that minutely, hourly, daily, weekly, or monthly, progress is shown to the user indicating whether they are operating within or outside their set budget.



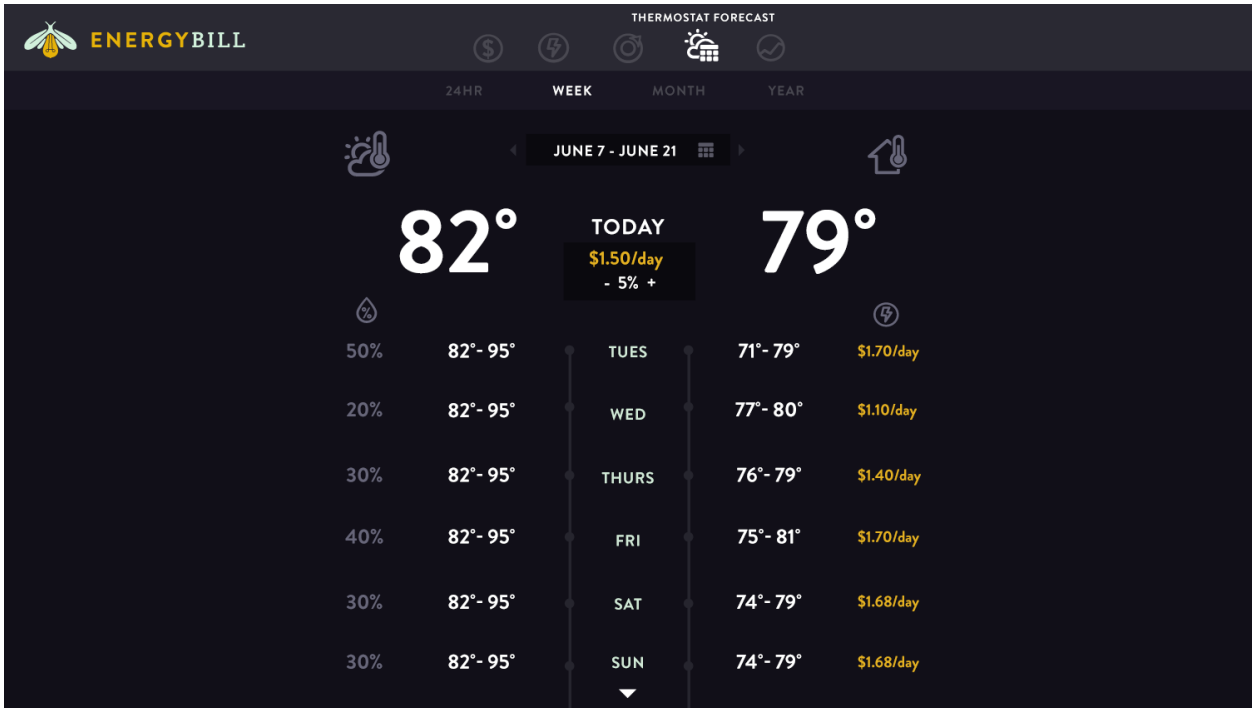
Thermostat Control

The system then allows the user to control their smart thermostat remotely. Our system allows them to control any smart thermostat on the market from our application. They could even have multiple thermostats in the home, from different manufacturers, and they can control all of them from a single point.



Thermostat Management & Forecast

Using our predictive model the system allows users to have their thermostat managed for them based on their budget. When in "managed" mode our system will regulate their indoor temperature throughout the day in order to keep them within their defined budget level. In accordance with this the system provides them with a "thermostat forecast," which is a kind of indoor weather forecast. Since our system will be controlling their temperature, we forecast for them what those temperature levels will be on an hourly, daily, and weekly basis. Users can then adjust the budget if they want to increase the comfort level in the structure.



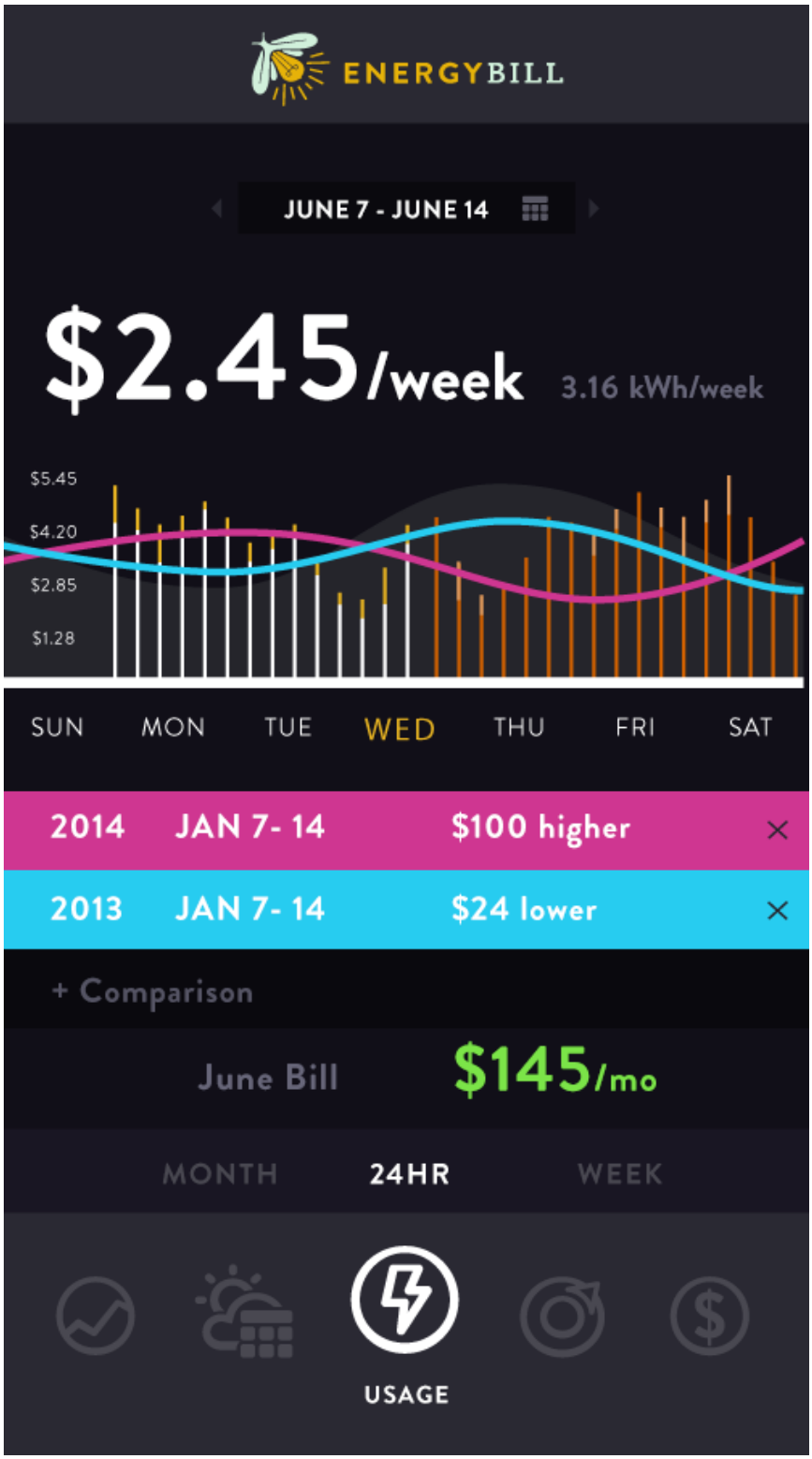
Data Trending

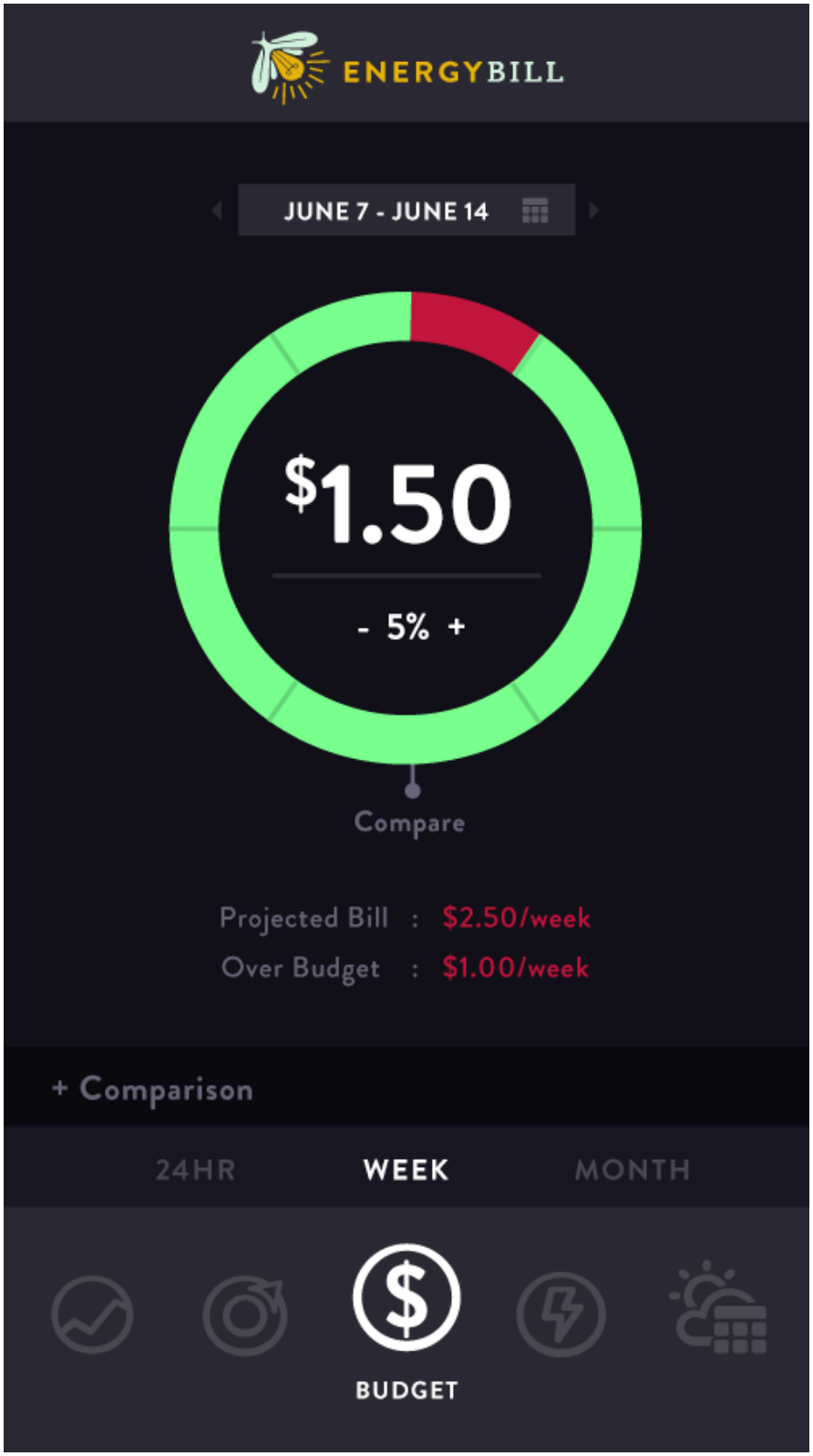
The system also allows users to trend all of the information that we are aggregating in realtime. They can see the historical, current, and future trends for all the data sources that we are importing.

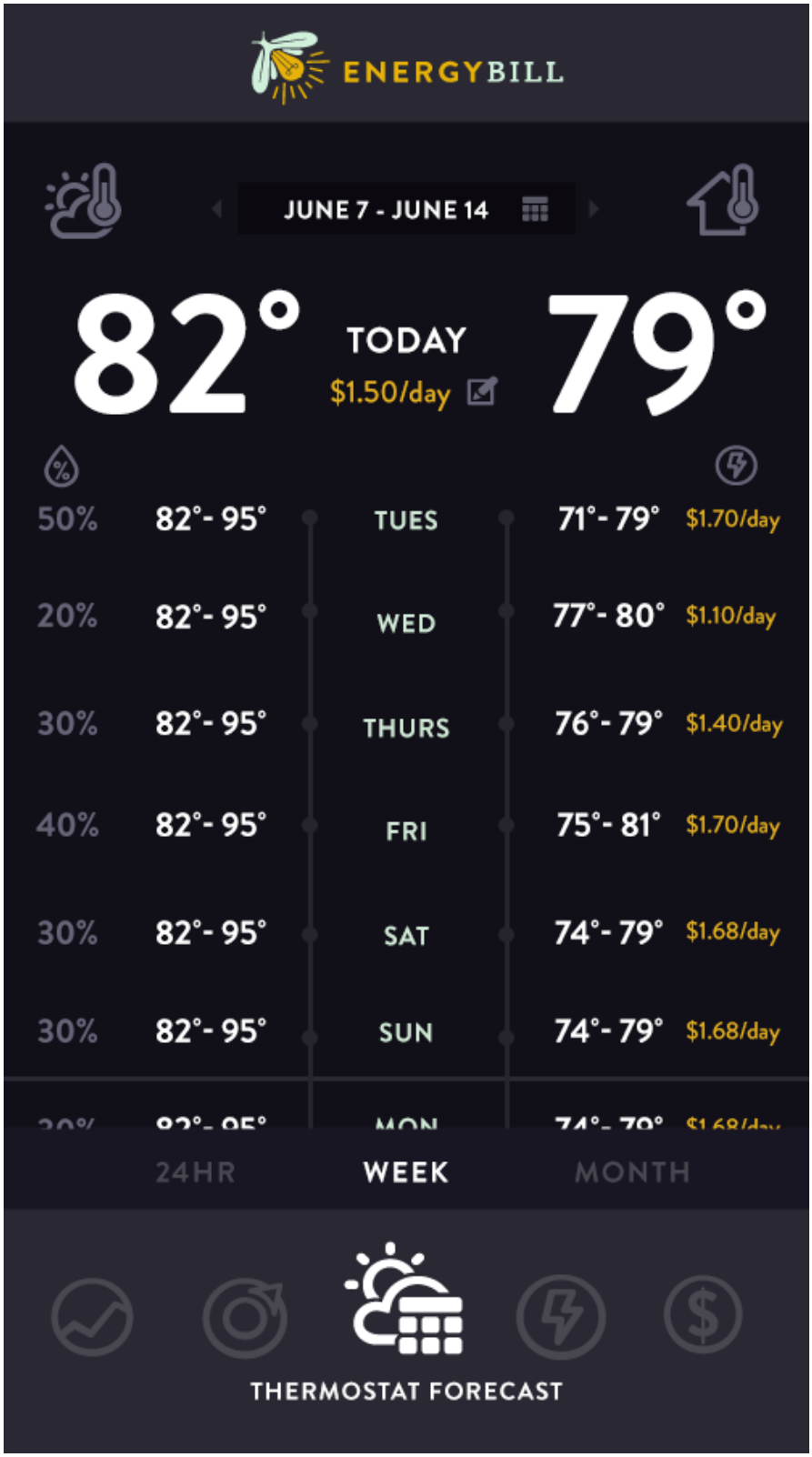
- Outdoor weather, temperature, and humidity.
- Indoor setpoint or target temperature and humidity.
- Indoor current temperature and humidity.
- Energy consumption in kWh and Dollars
- Billing data
- AC mode, ie active cooling or heating

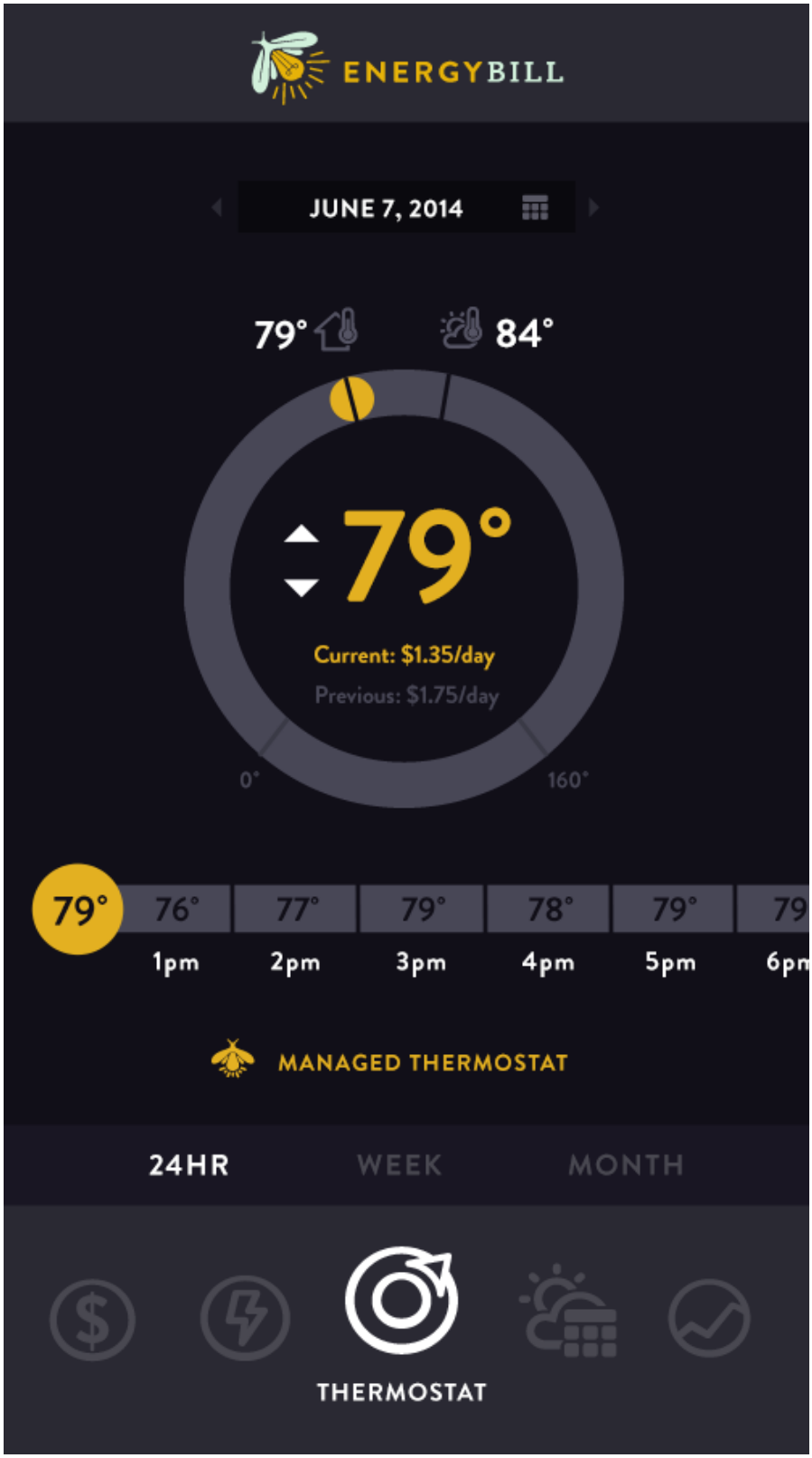
Mobile Design

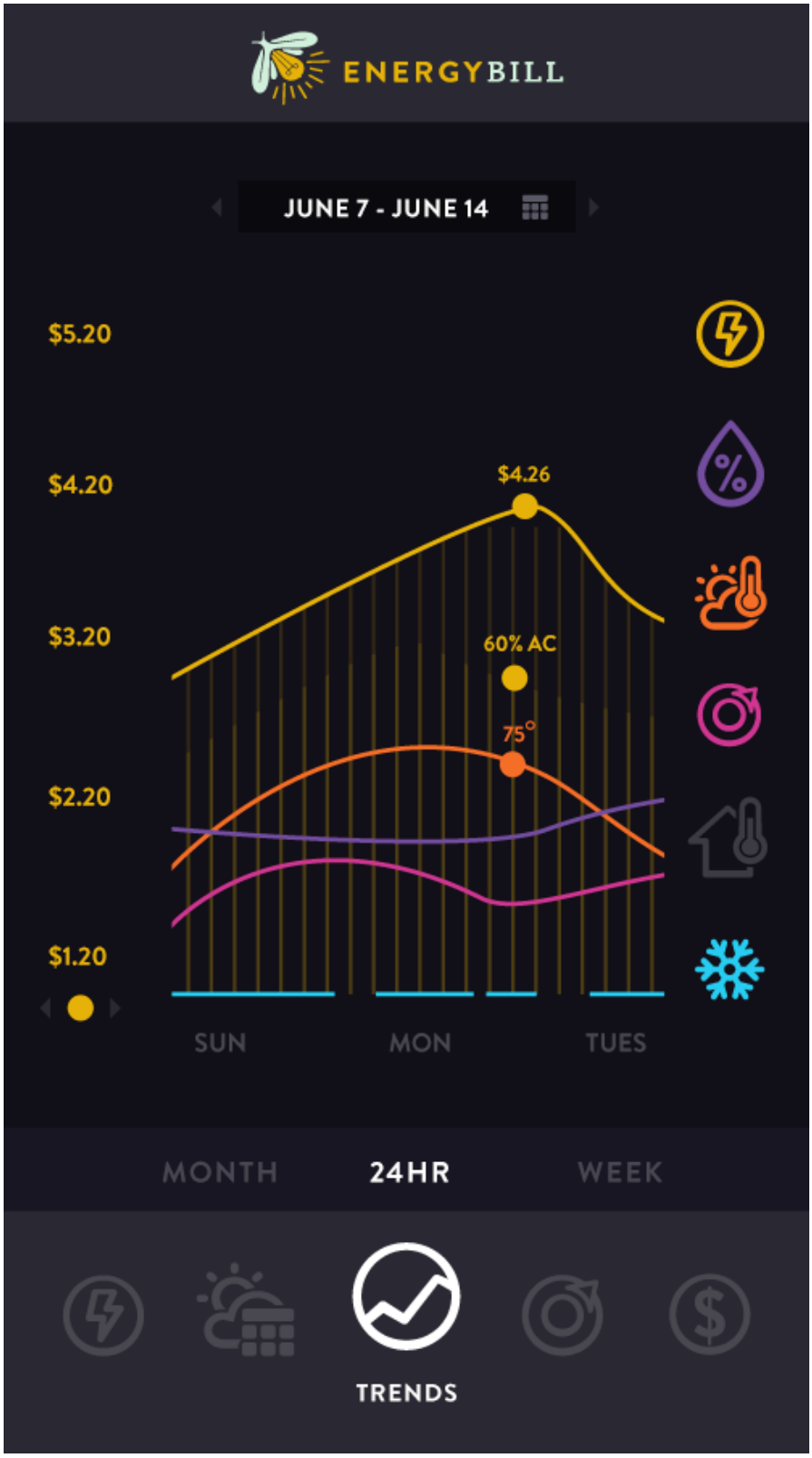
Same functionality mobile proportions.




ENERGYBILL
JUNE 7 - JUNE 14
$1.50
- 5% +
Compare
Projected Bill : $2.50/week
Over Budget : $1.00/week
+ Comparison
24HR
WEEK
MONTH
BUDGET


ENERGYBILL
JUNE 7 - JUNE 14
82°
TODAY
$1.50/day
79°
50% 82°- 95° TUES 71°- 79° $1.70/day
20% 82°- 95° WED 77°- 80° $1.10/day
30% 82°- 95° THURS 76°- 79° $1.40/day
40% 82°- 95° FRI 75°- 81° $1.70/day
30% 82°- 95° SAT 74°- 79° $1.68/day
30% 82°- 95° SUN 74°- 79° $1.68/day
24HR
WEEK
MONTH
THERMOSTAT FORECAST


ENERGYBILL
JUNE 7, 2014
79°
84°
79°
Current: $1.35/day
Previous: $1.75/day
0°
160°
79°
76°
77°
79°
78°
79°
79
1pm
2pm
3pm
4pm
5pm
6pm
MANAGED THERMOSTAT
24HR
WEEK
MONTH
THERMOSTAT


ENERGYBILL
JUNE 7 - JUNE 14
$5.20
$4.20
$3.20
$2.20
$1.20
$4.26
60% AC
75°
SUN
MON
TUES
MONTH
24HR
WEEK
TRENDS